

## CLAIMS

What is claimed is:

1. A split compressor, comprising:

a first housing;

a secondary housing, the secondary housing being within the first housing;

a sealing means positioned within the first housing and the secondary housing defining a low pressure chamber and a high pressure chamber, the low pressure chamber being located above the high pressure chamber, the sealing means maintaining a pressure differential between the low pressure chamber and the high pressure chamber and preventing fluid communication between the low pressure chamber and the high pressure chamber;

a motor disposed within the secondary housing of the low pressure chamber;

a compressor portion located within the high pressure chamber, the compressor portion operably connected to the motor, the compressor portion having a compressor suction inlet and a compressor discharge port;

a suction tube inlet extending into the low pressure chamber, the suction tube inlet introducing a fluid from outside the compressor through the first housing into the low pressure chamber;

means for deflecting the fluid positioned substantially adjacent the suction tube inlet;

an accumulator positioned within the low pressure chamber above the sealing means, the sealing means forming a lower boundary of the accumulator;

a channeling means to provide fluid communication of a substantially gas stream between the low pressure chamber and the compressor suction

inlet, the channeling means extending across the sealing means and internal to the first housing;

an orifice through the sealing means providing fluid communication between the internal accumulator and the compressor suction inlet to allow liquid fluid accumulated in the internal accumulator to move in a controlled fashion across the sealing means from the low pressure chamber to the compressor suction inlet where it is mixed with the gas stream, compressed and discharged into the high pressure chamber;

a means for providing a second fluid communication between the low pressure chamber and the compressor suction inlet between a first housing wall and a secondary housing wall to allow liquid fluid accumulated on the sealing means between the first housing wall and the secondary housing wall to move across the sealing means to the compressor suction inlet where it is compressed and discharged;

a lubrication sump positioned within the high pressure chamber for receiving and storing lubricant discharged into the high pressure chamber;

a discharge outlet to provide a discharge path for compressed gas from the compressor portion; and

wherein fluid passing into the compressor portion through the compressor suction inlet is compressed and discharged through the compressor discharge port into the high pressure chamber, and then discharged from the high pressure chamber through the discharge outlet.

2. The compressor of claim 1 wherein the sealing means includes a partition plate and a bearing assembly, the partition plate sealingly positioned within the first housing between the first housing wall and the secondary housing wall, and the bearing assembly sealingly positioned within the secondary housing wall, the partition plate and bearing assembly defining the low pressure chamber and the high pressure chamber, the low pressure chamber being located above the high pressure chamber within the compressor; the partition plate and bearing assembly maintaining a pressure differential between the low pressure chamber and the high

pressure chamber and preventing fluid communication between the low pressure chamber and the high pressure chamber.

3. The compressor of claim 2 wherein the channeling means that provides fluid communication of a substantially gas stream between the low pressure chamber and the compressor suction inlet extends across and above the partition plate.
4. The compressor of claim 3 wherein the partition plate is not flat with respect to a horizontal plane passing through the compressor to collect liquid in a predetermined location on the plate.
5. The compressor of claim 4 wherein the partition plate is at an angle with respect to a horizontal plane passing through the compressor to collect liquid in a predetermined location on the plate.
6. The compressor of claim 4 wherein the partition plate forms a radius to a horizontal plane passing through the compressor to collect liquid in a predetermined location on the plate.
7. The compressor of claim 4 wherein the means for providing a second fluid communication includes providing a second fluid communication from a predetermined location on the plate to the compressor suction inlet.
8. The compressor of claim 3 wherein the means for providing a second fluid communication through the sealing means includes a fluid connection across the partition plate into the channeling means.
9. The compressor of claim 4 wherein the fluid connection is a tube.
10. The compressor of claim 4 wherein the fluid connection is an orifice.

11. The compressor of claim 2 wherein the partition plate is not flat with respect to a horizontal plane passing through the compressor to collect liquid in a predetermined location on the plate.
12. The compressor of claim 11 wherein the channeling means between the low pressure chamber and the compressor suction inlet does not extend above the partition plate.
13. The compressor of claim 12 wherein the means for providing a second fluid communication between the low pressure chamber and the compressor suction inlet is the channeling means that moves collected liquid across the partition plate from a preselected location on the plate to the compressor suction inlet.
14. The compressor of claim 11 wherein the partition plate is at an angle with respect to a horizontal plane passing through the compressor to collect liquid in a predetermined location on the plate.
15. The compressor of claim 11 wherein the partition plate forms a radius to a horizontal plane passing through the compressor to collect liquid in a predetermined location on the plate.
16. The compressor of claim 1 wherein the sealing means includes a motor bearing with a seal affixed within the secondary housing wall.
17. The compressor of claim 1 wherein the sealing means includes a plate within the secondary housing.
18. The compressor of claim 1 further including a means to control the flow of liquid between the internal accumulator and the compressor inlet port so as to reintroduce liquid in the form of lubricant into a gas stream in a controlled fashion.

19. The compressor of claim 18 wherein the orifice in the sealing means for providing fluid communication between the internal accumulator and the compressor suction inlet further includes a valve that is activated in response to a predetermined condition.
20. The compressor of claim 1 further including a compressor portion which discharges compressed fluid from the compressor discharge port into a second chamber on the high pressure side before the compressed fluid is discharged through the discharge outlet of the compressor, the second chamber including at least one surface upon which the discharged gas impinges.
21. The compressor of claim 1 further including means for heating liquid accumulated in the internal accumulator.
22. The compressor of claim 21 wherein the means for heating liquid in the internal accumulator includes at least one winding of the motor.